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FOREST PEST MANAGEMENT

3430 BIOLOGICAL EVALUATION
R2-82-9

MOUNTAIN PINE BEETLE ON THE
HOLY CROSS RANGER DISTRICT
WHITE RIVER NATIONAL FOREST
INCLUDING HOLY CROSS WILDERNESS
AND EAGLES NEST WILDERNESS
1982

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Forest Pest Management
Denver, Colorado

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MOUNTAIN PINE BEETLE ON THE HOLY CROSS RANGER DISTRICT WHITE RIVER NATIONAL FOREST INCLUDING HOLY CROSS WILDERNESS AND EAGLES NEST WILDERNESS 1982

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INTRODUCTION

Forest Pest Management was requested by the White River National Forest to evaluate the probable course of the mountain pine beetle, *Dendroctonus ponderosae* Hopkins currently active in and associated with the Holy Cross Ranger District, including the Holy Cross Wilderness, Eagles Nest Wilderness and associated private, State and Bureau of Land Management lands. While this evaluation specifically discusses the mountain pine beetle situation with regard to the Holy Cross Ranger District, the evaluation also applies to all of the Holy Cross Wilderness and the Eagles Nest Wilderness.

SITUATION

Lodgepole pine type on the Holy Cross Ranger District and associated lands covers 45,410 acres. At this time 24,580 acres (54%) are susceptible to mountain pine beetle infestation on the basis of diameter, age and elevation. Susceptible lodgepole pine acreage is: Holy Cross Ranger District 85%; Holy Cross and Eagles Nest Wilderness (Holy Cross Ranger District portion) 7%; private lands 7%; and less than one percent in State (Colorado) and Bureau of Land Management holdings (Table 1).

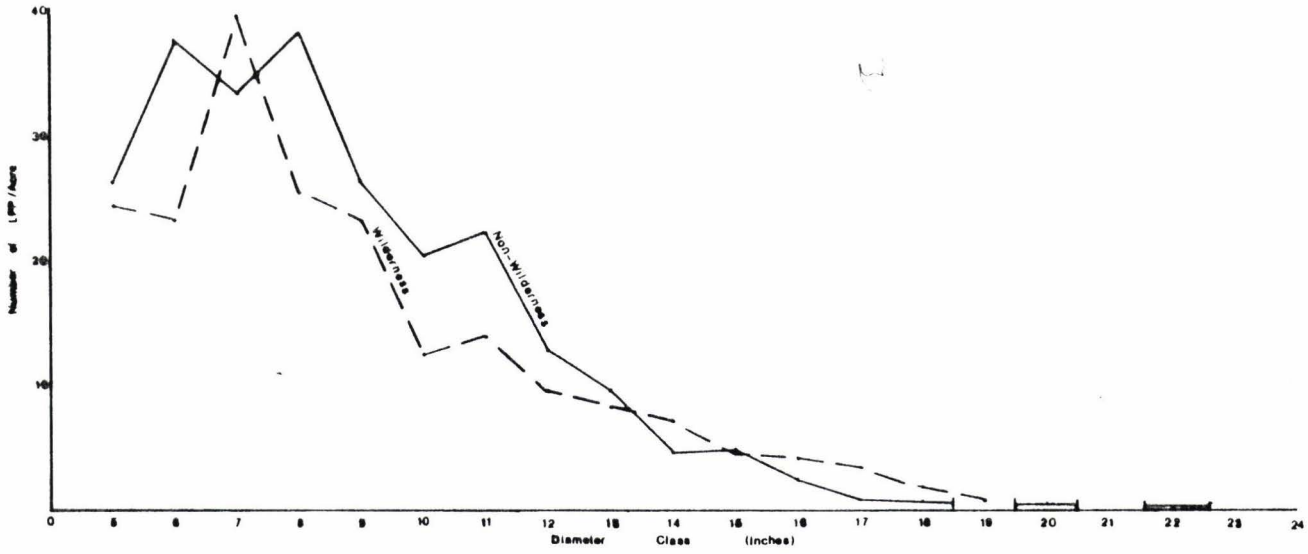
Table 1. Percentile breakdown by land management of 24,580 of susceptible lodgepole pine acres on the Holy Cross Ranger Ranger District and associated lands

Land Management Category	Percent of Lodgepole Pine Acres Susceptible to MPB
National Forest	85
Wilderness (Eagles Nest & Holy Cross)	7
Private	7
State and Other Federal	1
	100

An aerial survey conducted during July 1982 indicated that 83,600 trees on 16,300 acres (66%) of the susceptible type were infested in the fall of 1981. Broken out by ownerships this averages five infested trees/acre on the National Forest System lands outside of wilderness; two infested trees/acre in the Holy Cross Wilderness; one infested tree/acre in the Eagles Nest Wilderness; and four infested trees/acre on private lands.

Data collected in 1980 (Lister 1981) from the Cross Creek area provide some insight into the relative homogeneity of adjacent wilderness and nonwilderness stands (Figure 1). Stands within the wilderness average 11.7" $\pm$ 2.2" d.b.h. with 57% of the stems over 8" d.b.h. The nonwilderness stands average 10.9" $\pm$ 2.2" d.b.h. with 59% of the stems over 8" d.b.h.

FIGURE 1 -- DIAMETER DISTRIBUTION OF LODGEPOLE PINE IN WILDERNESS AND NON-WILDERNESS IN THE CROSS CREEK AREA, HOLY CROSS RANGER DISTRICT, WHITE RIVER NATIONAL FOREST.



Population density remains within the 50 ± 28 beetles/sq.ft. determined by Lister in 1981. Old attack to new attack ratios vary from 1:1 to 1:5 depending upon location within the District. No evidence of impending population collapse was found.

DISCUSSION

Seven percent of the susceptible lodgepole is located within designated wilderness areas on the District. At this time the infestation is significantly less severe within wilderness areas than nonwilderness. This situation can be expected to continue due to the distribution of susceptible type between wilderness and nonwilderness lands, primarily affected by elevation. Lister's 1981 Biological Evaluation displays a breakdown of lodgepole pine by elevation on the District. Along the lower borders of the wilderness boundary, significant tree mortality can be expected (60-80% of the stems over 8" d.b.h.) during the course of this outbreak. From a planning perspective the District should anticipate finding two 1982 attacked trees for each 1981 attacked tree. The current estimate of fader trees in 1983 for the District is 200,000.

ALTERNATIVES

Current Direction

The current direction is aimed at meeting the objectives stated in the Summit County-Upper Eagle Project Area, Operating Plan, dated October 9, 1981. Those objectives are:

A. The primary objective is to reduce the mountain pine beetle population in the two proposed areas through direct and indirect treatment methods.

B. Other objectives are to:

1. Protect property values and other developments
2. Attain long term Forest management
3. Maintain visual quality
4. Maintain a quality recreational experience
5. Lower wildfire hazard
6. Maintain water quality
7. Enhance wildlife habitat

Treatment actions for direct control are salvage and chemical treatment of the infested trees and inventory and analysis (Stage II) for developing stand prescriptions to effect indirect control (prevention). Partial accomplishment of the Stage II effort has been made, 23,000 acres remain uncompleted.

The District's effort to decrease the number of acres of high risk stands outside of the wilderness will have a positive effect upon the eventual outcome. Removal of infested trees from high value and high priority stands will dampen the immediate area population risk. At the same time, if stands are thinned concurrently, those stands should become low beetle risk. Mature high risk stands should be regenerated to low risk stands of seedlings and saplings. Success in the implementation of this alternative is highly dependent upon adequate markets and ability to bring a large acreage under management in a relatively short time.

Current direction is to allow the beetle to follow a natural course within designated wilderness areas. This direction is consistent with the intent of wilderness legislation. In order to treat the beetle population within designated wilderness, it must be shown that action is necessary to prevent unnatural loss of the wilderness resource; unacceptable damage to resources on adjacent lands; or pose a threat to continued lawful uses and activities of the area. The wilderness resource is dominant in all management decisions where a choice must be made between wilderness values and any other activity.

Since MPB coevolved with lodgepole pine it is a natural component of the lodgepole pine ecosystem. Mountain pine beetle is interpreted as a natural thinning and harvesting agent of lodgepole pine, Peterman (1978). Thus, mountain pine beetle is an indigenous natural force in the direct successional changes that are essential to wilderness concepts. This mountain pine beetle outbreak does not present a threat to continued lawful uses and activities within the designated wilderness areas. Seven percent of the current ideal habitat for MPB is located within designated wilderness, 93 percent is outside of designated wilderness boundaries. The insect epidemic threat to resource values is greater from conditions outside of designated wilderness areas than from within. For the next several years, it is reasonable to expect a greater migration of and buildup in place of MPB into the wilderness areas from adjacent nonwilderness lands. Placing stands adjacent to the wilderness under management would reduce the threat perceived to be originating from wilderness lands. A similar conclusion is forecast by Lister (1982) for the east side of Eagles Nest Wilderness.

Do Nothing

Under this alternative the District would proceed with the harvesting schedule established prior to the implementation of the Summit-Upper Eagle Project. The MPB population would probably go through its outbreak phase rapidly and with greater intensity. More trees would be killed sooner than is now the case. The population would collapse sooner than it probably will now. Visually there would be a greater amount of dead and dying trees outside designated wilderness areas than within and be concentrated over a shorter period of time. If the population expands to include the majority of currently susceptible stands, significant populations of MPB would be absent from the District for 20 to 40 years.

Direct Suppression Against the Beetle

Both Lindane and Ethylene Dibromide (EDB)* are registered for use against the mountain pine beetle. Both are very effective in controlling the beetle population within treated trees. Both insecticides can be applied with minimal adverse effect to the environment. Unless the underlying forest conditions are corrected to reduce susceptible habitat for the mountain pine beetle, the approach serves only as a high cost cosmetic effect of short duration.

Management of the Beetles Habitat

Reducing the amount of beetle habitat by implementing silvicultural treatments on a timely basis and repeating those entries as stands grow into a susceptible stage would reduce the amount of habitat available for MPB to exploit at any one time. Burning stands that are infested or susceptible to MPB would also reduce the amount of available habitat. Burning could probably be employed under the constraints of the Wilderness Act, if naturally ignited, but the silvicultural treatment could not be applied to designated wilderness lands under current policy.

Integration of Alternatives

Due to the size of the area and the complexity of management objectives, no one solution will meet the objective of reducing beetle populations and minimizing beetle risk. In addition Federal law and regulations effect the implementation of a solution under some situations. Therefore, a combination of solutions is viable to meet the objective.

RECOMMENDATIONS

The mountain pine beetle is expected to increase on all lands within the Holy Cross Ranger District boundaries that contain MPB susceptible size host material. Ninety-three percent of the high risk acreage is associated with nonwilderness designated lands. The opportunity to mitigate the adverse effects of mountain pine beetle is much greater on these lands than the susceptible acreage lying within the designated wilderness areas.

The following recommendations are made:

1. Continue implementation of the recommendations made by Lister (1981). These are:

    a. Identify, list and quantify management objectives and goals for this special project area.

    b. If the MPB outbreak is threatening attainment of management objectives, quickly identify and obtain stand and other pertinent information.

* EPA cancellation of this material is pending.

c. Develop a comprehensive action plan to mitigate the impacts of the MPB infestation and be responsive to attainment of the objectives and goals established for the area.

2. Complete all Stage II inventory and analysis. When Stage II inventory and analysis is completed for each stand, it can then be risk rated. Forest Pest Management can assist if needed and requested.

3. All stands should be mapped by risk catagory and matched against management objectives to determine appropriate action. This should be for lodgepole pine stands of every ownership, private and federal.

4. Develop jointly with the State of Colorado an information and education package dealing with the intent of the Wilderness Act and how MPB assists in attaining wilderness goals.

5. Implement sound silvicultural treatments on those stands immediately outside the designated wilderness boundaries to create a diversity of stand age and size class that will constitute a buffer against migrating beetles.

The following prescriptions should cover stands located in this area and are also valid for other lodgepole forested areas on the Forest.

1. Susceptible Lodgepole Pine Without Understory - Undeveloped Forest

a. Cutting Methods:

(1) Clearcut stands up to 40 acres in size
(2) Patch cut within stands with cut units up to 10 acres in size

All basal area of lodgepole pine would be removed in both treatments.

b. Slash Disposal and Site Preparation Methods:

(1) Lop and scatter slash
(2) Salvage for firewood

c. Regeneration Methods: Natural regeneration

d. TSI Methods: Not applicable

e. Other Treatments:

(1) Salvage any uncut areas within stands
(b) Fell unmerchantable trees infected with dwarf mistletoe

f. Constraints:

Size of adjacent areas not clearcut should be approximately equal or larger in size to clearcut areas. Shapes will be influenced by appearance of the openings from important vantage points.

2. Susceptible Lodgepole Pine Without Understory - Developed Forest

a. Cutting Methods:

(1) Patch cut within stands
(2) Shelterwood seed cut to basal area of 60 or less
(3) Thin from above removing most susceptible trees first to an approximate growing stock of 80
(4) Thin from below to an approximate growing stock level of 80

b. Slash Disposal and Site Preparation Methods:

(1) Pile and burn
(2) Physical removal
(3) Lop and scatter
(4) Salvage for firewood

c. Regeneration Methods:

(1) Natural regeneration
(2) Plant species best suited to site

d. TSI Methods: Fell unmerchantable lodgepole in thinning treatments as needed to meet growing stock level objective.

e. Other Treatments: Preventive treatment with chemicals

f. Constraints:

(1) Size of patch cuts to be constrained by location, appearance, and owner objectives.
(2) Partial cuts constrianed by windthrow susceptibility, dwarf mistletoe infection level, owner objective, or other on-site conditions.

3. Susceptible Lodgepole Pine With Manageable Understory - Undeveloped Forest

a. Cutting Methods:

(1) Removal cut taking all lodgepole pine in excess of 7 inches d.b.h.
(2) Removal cut in stages, taking the most susceptible lodgepole pine in the first cut.

b. Slash Disposal and Site Preparation Methods:

(1) Lop and scatter
(2) Salvage for firewood

c. Regeneration Methods: Not applicable

d. TSI Methods:

(1) Thin understory if needed
(2) Remove mistletoe infected lodgepole in understory

e. Other Treatments: None

f. Constraints: Size and shape of opening may be constrained as in clearcutting if understory is not of sufficient size to have visual significance.

4. Susceptible Lodgepole Pine With Understory - Developed Forest

a. Cutting Methods:

(1) Removal cut in stages removing the most susceptible lodgepole pine in the first cut
(2) Removal cut in one cut in patches up to 10 acres

b. Slash Disposal and Site Preparation Methods:

(1) Pile and burn
(2) Physical removal
(3) Lop and scatter
(4) Salvage for firewood

c. Regeneration Methods: Not applicable

d. TSI Methods:

(1) Thin understory if needed
(2) Remove mistletoe infected lodgepole in understory

e. Other Treatments: Preventive spray

f. Constraints: Size and shape of opening in one cut removals will be determined by owner objective and visual impact.

5. Susceptible Lodgepole Pine with Mixture of Other Species - Undeveloped Forest

a. Cutting Methods:

(1) Shelterwood seed cut to basal area of 60 or less, retaining mixed species for seed and shelter.
(2) Improvement - salvage cut removing the most susceptible lodgepole and worst individuals of mixed species.
(3) If mixed with aspen, patch cut lodgepole around the aspen. Aspen may or may not be cut depending on situation. Remove lodgepole pine from aspen patches.

b. Slash Disposal and Site Preparation Methods:

(1) Lop and scatter
(2) Salvage for firewood

c. Regeneration Methods: Natural regeneration

d. TSI Methods: Weed and release felling to favor the mixed species

e. Other Treatments: None identified

f. Constraints: None identified.

6. Susceptible Lodgepole Pine with Mixture of Other Species - Developed Forest

a. Cutting Methods:

(1) Improvement - salvage cut removing the most susceptible lodgepole pine and worst individuals of mixed species.
(2) Shelterwood seed cut to basal area of 60 or less, retaining mixed species for seed and shelter.
(3) Partial or patch cut to favor aspen only outside of campgrounds or other areas with heavy foot traffic.

b. Slash Disposal and Site Preparation Methods:

(1) Pile and burn
(2) Physical removal
(3) Lop and scatter
(4) Salvage for firewood

c. Regeneration Methods:

(1) Natural regeneration
(2) Plant species appropriate to site conditions, favor those other than lodgepole

d. TSI Methods: Weed and release felling to favor the mixed species

e. Other Treatments: Preventive spray

f. Constraints: Site specific depending on location

7. Stagnated Immature, Nonsusceptible - Undeveloped and Developed Forest (Judged not capable of release, generally more than 70 years, rounded or tufted tops, less than 40% live crown, or DMR rating of 3.0 or more)

a. Cutting Methods: Defer treatment

b. Slash Disposal and Site Preparation Methods: Defer treatment

c. Regeneration Methods: Defer treatment

d. TSI Methods: Defer treatment

e. Other Treatments: None identified

f. Constraints: None identified

8. Immature, Responsive Lodgepole Pine - Undeveloped and Developed Forest

a. Cutting Methods:

(1) Precommercial thinning between August and March to a growing stock level of 110 or less
(2) Defer treatment

b. Slash Disposal and Site Preparation Methods:

(1) Lop and scatter
(2) Salvage for firewood
(3) Pile and burn
(4) Chipping

c. Regeneration Methods: Not applicable

d. TSI Methods:

(1) Thin by felling
(2) Sanitize by felling mistletoe infected lodgepole

e. Other Treatments: None identified

f. Constraints: Site specific, depending on location

9. Immature, Responsive Lodgepole with 10% or More Other Species - Undeveloped and Developed forest Sites

a. Cutting Methods:

(1) Precommercial thinning between August and March to a growing stock level of 110 or less. Favor other species to the extent possible.
(2) Defer treatment

b. Slash Disposal and Site Preparation Methods:

(1) Lop and scatter
(2) Salvage for firewood
(3) Pile and burn
(4) Chipping

c. Regeneration Methods: Not applicable

d. TSI Methods:

(1) Thin by felling
(2) Sanitize by felling mistletoe infected lodgepole

e. Other Treatments: None identified

f. Contraints: Site specific, depending on location

10. Other Species with Less than 30% Basal Area of Lodgepole Pine

a. Cutting Methods:

(1) Salvage cut to remove lodgepole pine and/or dead and dying trees of other species
(2) Defer treatment

b. Slash Disposal and Site Preparation Methods:

(1) Physical removal
(2) Lop and scatter
(3) No treatment
(4) Salvage for firewood

c. Regeneration Methods: Not applicable

d. TSI Methods: Not applicable

e. Other Treatments: Preventive chemical spray on Developed Forest Sites

f. Constraints: None identified

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